BUSINESS - CONFIDENTIAL

RS 1-1-62 3429

INTRA-LABORATORY CORRESPONDENCE

OAK RIDGE NATIONAL LABORATORY

January 12, 1962

To: T. J. Burnett ✓
J. C. Hart
A. D. Warden

Time:

Date: 1/5/62

Re: Unusual Occurrence at TSF

Place: 7700 Area

A radiation exposure incident resulting in permissible but significant external exposures to two Laboratory employees occurred in mid-afternoon on Friday, January 5, 1962, in the area around the Tower Shielding Facility. The incident occurred under the following circumstances.

The instrument group assigned to the TSF had previously determined that some of their problems were due to line noise in the power supply to the facility and a request had been made to the Electrical Department of the E and M Division to check the power line to see if the difficulty could be corrected. On the day of the incident the line crew foreman, [redacted] ([redacted]), took his crew up to the reservoir (approximately 5000' from the TSF) and instructed two linemen, [redacted] ([redacted]) and [redacted] ([redacted]), to proceed toward the TSF, checking the line as they progressed. He (the foreman) and the line service truck (with driver) were to go around the road and meet the linemen when they reached the Tower Facility.

[redacted] arrived at the guard station at the 5000' fence on the TSF approach road at approximately 2:28 p.m. The guard informed TSF personnel of the situation immediately and the reactor (operating at 100 KW) was scrammed immediately. [redacted] ([redacted]), TSF supervisor, announced over the external PA system that anyone approaching the reactor area should retreat. [redacted] then started along the power line clearing to pick up the men in his truck. [redacted], fearing that the path might be impassable to the truck, set out on foot to contact the men.

In the meantime, the linemen had proceeded with their assignment. They had progressed toward the TSF until they reached the first line-of-sight point where they observed the red warning lights were on and no personnel were to be seen outside of the control house. Showing commendable presence of mind and good judgment, they had already begun their retreat when they heard the announcement over the PA system.

The line truck did not succeed in reaching the men and [redacted] first contacted them at about 2500' from the TSF. He brought them back toward the control room and had them indicate their point of closest approach which was approximately 1200' from the storage pool (they had approached to within approximately 100' of Pad 5 which is at a measured distance of 1100'). When they arrived at the control room, Cain immediately checked each of their film badges with a GMSM to see if any indium foil activation could be detected. He found no significant indication of activity from the badge of either man.

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During the time after shutdown, the secretary at the Tower had been attempting to locate the writer by telephone. The writer talked with [redacted] at approximately 3:05 p.m., being informed of the occurrence at this time. It was requested that [redacted] instruct the men to proceed to the Personnel Monitoring offices at the West Portal. They arrived there at approximately 3:20 p.m., and their badges were again checked for induced activity of components. At this time, a portable scintillation counter was used to make the survey, and activity of approximately 400 c/m was detected above the background of approximately 2000 d/m. This counter had been calibrated previously, using a radium source, and found to show approximately 31000 c/m in a field of 0.5 mrad/hr.

All dosimetry components in the badges were removed and turned over to D. M. Davis for dose evaluation. The men were instructed to proceed to the East Portal to have new slides and films inserted in their badges and then go to their shop office and await further instructions.

The Director of Radiation Safety and Control was contacted at 3:30 p.m. and given all the information available at that time.

Examination of the chemical dosimeters from the badges showed no detectable color change which indicated that the exposure was less than approximately 100 rad. The procedure, in such cases, calls for film processing rather than glass rod reading and this was started immediately. The slide (containing the indium foil) was again checked for induced activity, using an end window GM counter, and this time showed approximately 250 c/m. On the basis of this information, a discussion between W. S. Snyder, G. S. Hurst, J. C. Hart, and T. J. Burnett led to the conclusion that the exposures were not of sufficient magnitude to warrant medical examination or treatment.

Preliminary examination of the sensitive gamma film shortly after 4:00 p.m. indicated that the gamma exposure was less than 50 mrad. [redacted] and [redacted] were contacted at 4:15 p.m., notified that their exposures were within acceptable limits, and instructed to proceed with their normal activities.

The final dose determinations were as follows:

	Gamma Mrad		Neutron Mrem	Total Mrem	
	Ds	Dc		Ds	Dc
[redacted]	30	30	45	75	75
[redacted]	30	30	40	70	70

It is readily apparent that the potential seriousness of this occurrence was of far greater magnitude than is indicated by the actual exposures to the men. The situation, as it developed, must be regarded as a "near-miss" incident.

The protection afforded by administrative procedures is tenuous at best and becomes even weaker where access to large areas by personnel not under the direct supervision of those having responsibility for the area is involved. This point

has been raised before in previous discussions regarding the desirability of erecting a positive exclusion type barrier around the Tower Shielding Facility. It is thought to be still valid and worthy of new consideration in view of this occurrence.

It has been suggested that the "Radiation Hazard--Keep Out" signs which are in place on the barbed wire fence at the 3000' radius be augmented or supplanted by other signs, not so commonly encountered, which state that entrance may be made only on specific authority from TSF supervision. The suggestion seems entirely reasonable and appears to be the minimum action that could be taken to help prevent a recurrence of a wholly undesirable situation. The suggestion, with credit to M. E. Ramsey and J. C. Hart, is therefore presented here as a firm recommendation.

Initial draft: R. L. Clark
R. L. Clark - 1/8/62

Final draft: O. D. Teague
O. D. Teague

ODT:RLC:dc

cc: E. P. Blizard
F. R. Bruce
G. C. Cain
A. D. Callihan
D. M. Davis
C. R. Quinn
L. B. Holland
L. C. Johnson
K. Z. Morgan
H. E. Seagren
W. S. Snyder
W. M. Stanley

INTRA-LABORATORY CORRESPONDENCE

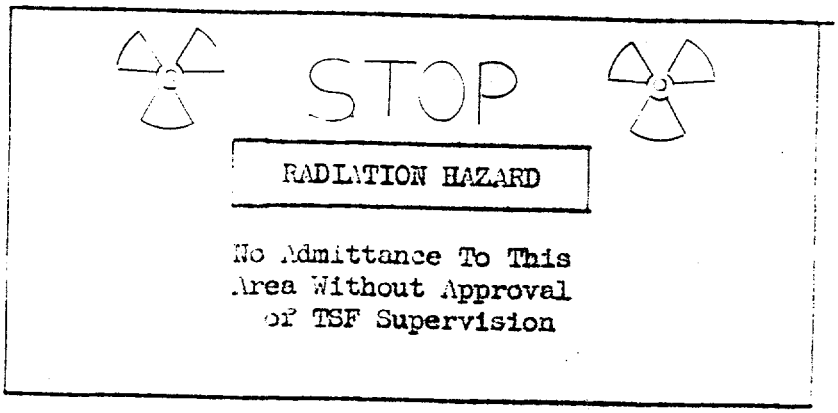
OAK RIDGE NATIONAL LABORATORY

February 9, 1962

To: W. S. Snyder

Re: Steps That Have Been Taken in Support of Recommendation Contained in Last Paragraph of Report by R. L. Clark on "Radiation Incident at TSF", January 5, 1962

TSF supervision have procured thirteen warning signs with wording and layout as indicated below:



Approximate size - 12" x 24"
Colors - Magenta and yellow

These signs are to be erected at the most probable approach routes as noted below:

3 signs where water line from X-10 crosses the fence line,
2 signs on road entering from Fast Burst Reactor area, (This road provides access to the TSF fence monitor location.)
3 signs at the fence monitor location, and
5 signs to be placed on Melton Hill side of fenced area.

Original Signed By
A. D. Warden

ADW:RLC:dc
cc: J. C. Hart

621 VALIDATION OF ORNL INCIDENTS/UNUSUAL OCCURRENCES(AEC-HMS) DATE RUN 03/07/74

SERIAL NUMBER	PER ORIE	AREA/FACILITY NUMBER	DATE OCCURRED	TIME OCCURRED	DURATION	WORK AREA OR PART FURTHER DEFINED	DESCRIPTION OF I
\00670		7700	01-05-62	0220		VIC STO POOL	PERSONN APPROACHD TSF WI

RADIATION ENCOUNTERED A	B	G	NF	NI	NT	MATERIALS INVOLVED	SPECIFIC RADIONUCLIDES	(AIR ACTIVITY) PEV	MIS	(MAX UCI/CC *) CF	RAD B/G MAX 10(-X) MR/H *	---------- TACTILE (MAX PROBE READING) ALP((C/M)/(D/M))	B-G(C/M)	CO

	(EXP TYPE)			(EXT EXP INV)			(INT EXP)						(SPEC SERV)	(MAX CON OF PERS C/M,D/M *)			(EXT DOS MA	
ID N A M E	EX RA	CL CD	PE CO	WB	TR	HD NE	FT LG	HA AR	VIA RE	OR	SK	UR SM	FE SM	WB CT	ME OB	PRIMARILY A	NORM B-G	BROK FP	NASL PE	SKIN SKIN	SMER	HEAD HNDS	TRNK
[redacted]	X			X																			
	X			X																			

** N O T E S

A-NO ACTION REQUIRED
B-ENTIRE AREA ZONED
C-AREA PART ZONED
D-ALL WORK STOP
E-NORMAL WORK CONT.
F-AREA NORM C MIN.
G-AREA NORM C MAX.
H-CLEANUP REQUIRED
I-AIR ACTIVITY PRESENT
J-SURFACE CONTAMINATION PRESENT
K-PERSONNEL EXPOSURE LIST

*
H = 100X, M = 1000X,R = MR/HR, WHERE C/M, D/M, UCI/CC ARE SHOWN IN COLUMN HEADINGS

REPORT R096

INCIDENT

WHILE IT WAS OPERA

CONTAMINATION DATA
) MAX SMEAR SAMP
M) ALP(D/M) B-G(D/

MAX MR)* (MED D
EAD WHOL INT SK SK
RNK BODY DOSE IR ER

75
70